

III. People Affected by Asthma in Washington

The prevalence of asthma is different among population subgroups in Washington. These differences are important to understand when planning programs, to assure that messages, campaigns, or policies reach the right people. When available, information about hospitalization and death rates is included for subgroups. When patterns of hospitalization or death are evident that cannot be explained by prevalence patterns, this may suggest need for targeted asthma control interventions.

The previous chapter described Washington asthma prevalence for broad age groups (adults and youth in general), and this chapter provides more refined descriptions of asthma by specific age groups in addition to gender and other key demographic groups.

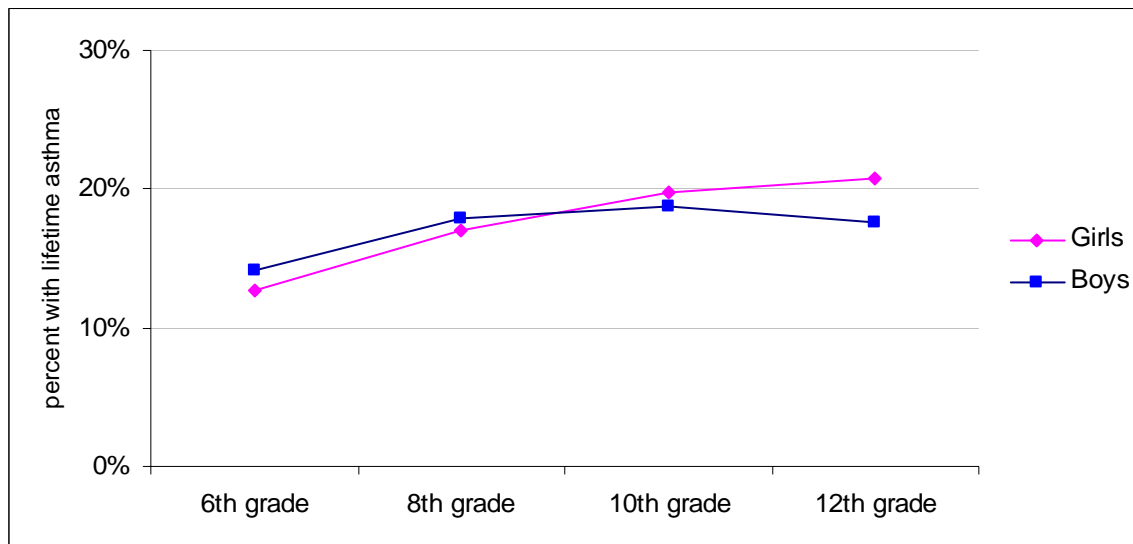
A. Age and Gender

Youth Lifetime and Current Prevalence

Gender-specific prevalence estimates in Washington for young children (younger than grade six) are not currently available; however national data indicate that boys are more likely to have asthma than girls at these ages.ⁱ The overall prevalence among children younger than five was 5% compared to 9% among school-aged children (see Figure 21), suggesting that asthma is least prevalent among the youngest children. Alternatively, due to the difficulties in accurately diagnosing asthma in young children, many practitioners may hesitate to “label” a patient with asthma without long-term history of symptoms, hence leading to an underestimate of true asthma prevalence in this age group.

Lifetime asthma among Washington elementary school-aged children was greater for boys than girls (14.1% vs. 12.7% in 6th grade). During middle school years – which correspond with the onset of puberty – the relative prevalences reverse, and by late high school girls had a greater lifetime prevalence of asthma than boys (17.6% vs. 20.7% for 12th grade, see Figure 26). This change may reflect continued increases in lifetime asthma (incidence) among girls by grade, and a relatively stable lifetime prevalence of asthma among boys in 8th grade and older.

Figure 1: Prevalence of lifetime asthma by grade and gender, among Washington youth

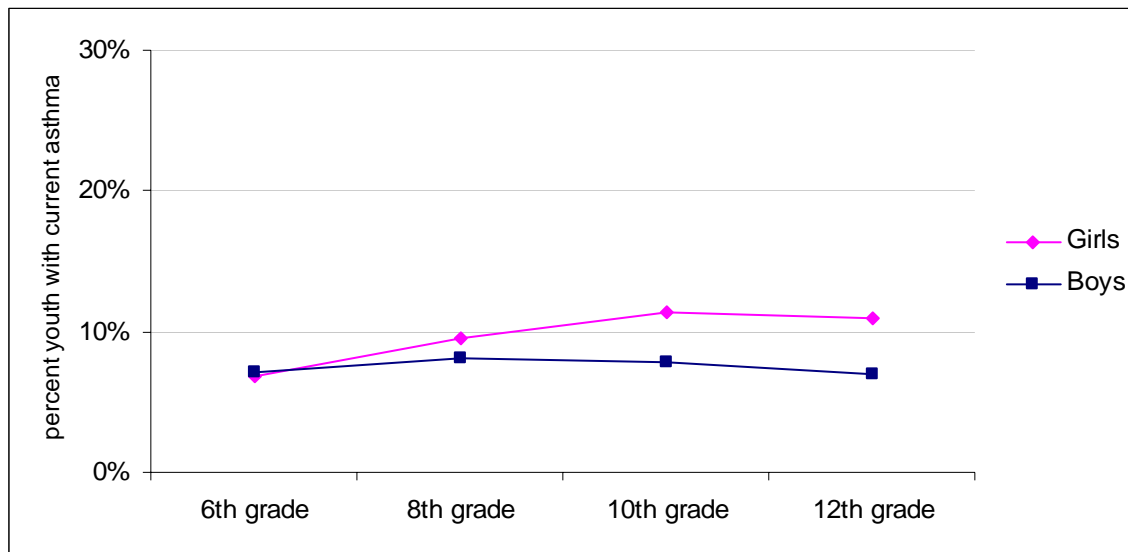


Source: combined 2002 and 2004 Washington State Healthy Youth Survey (HYS).

For current asthma, there was no difference between boys and girls for 6th grade, but in older grades girls were significantly more likely than boys to have current asthma (10.9% for girls vs. 7.0% for boys in 12th grade, see Figure 27).¹ As demonstrated for lifetime asthma, the prevalence of having current asthma progressively increases by age/grade for girls, but not for boys.

¹ Chi-square tests for association between asthma and gender within grades: 8th grade $p=.02$; 10th grade $p<.001$; 12th grade $p<.001$.

Figure 2: Prevalence of current asthma by grade and gender, among Washington youth



Source: combined 2002 and 2004 Washington State Healthy Youth Survey (HYS).

This gender reversal is not well-understood, despite having been widely noted.^{ii iii iv} The greater prevalence of current asthma among females in comparison to males persists during adulthood. Due to the timing of the reversal during puberty, a number of hypotheses have been explored regarding hormonal influences on asthma. It has been noted that progesterone can affect the regulation of beta-2-receptors, which enable relaxation of the bronchial tubes.^v It has also been shown that estrogen, when administered to post-menopausal women as hormone replacement therapy, is associated with adult-onset asthma.^{vi} A case-control study of progesterone, estradiol and cortisol levels in women reported that at least one of the levels was out of normal range in 80% of the women with asthma.^{vii} Thus, hormones that become activated among females during puberty may contribute to asthma.

Other authors have proposed that sex-related differences in airway size may account for some of the differences in asthma prevalence,^{viii ix} since airway size tends to be smaller in boys than girls during infancy, then reverses later. Small airways tend to be more compromised when exposed to a given allergenic stimulus, since flow through the airway depends on its radius.

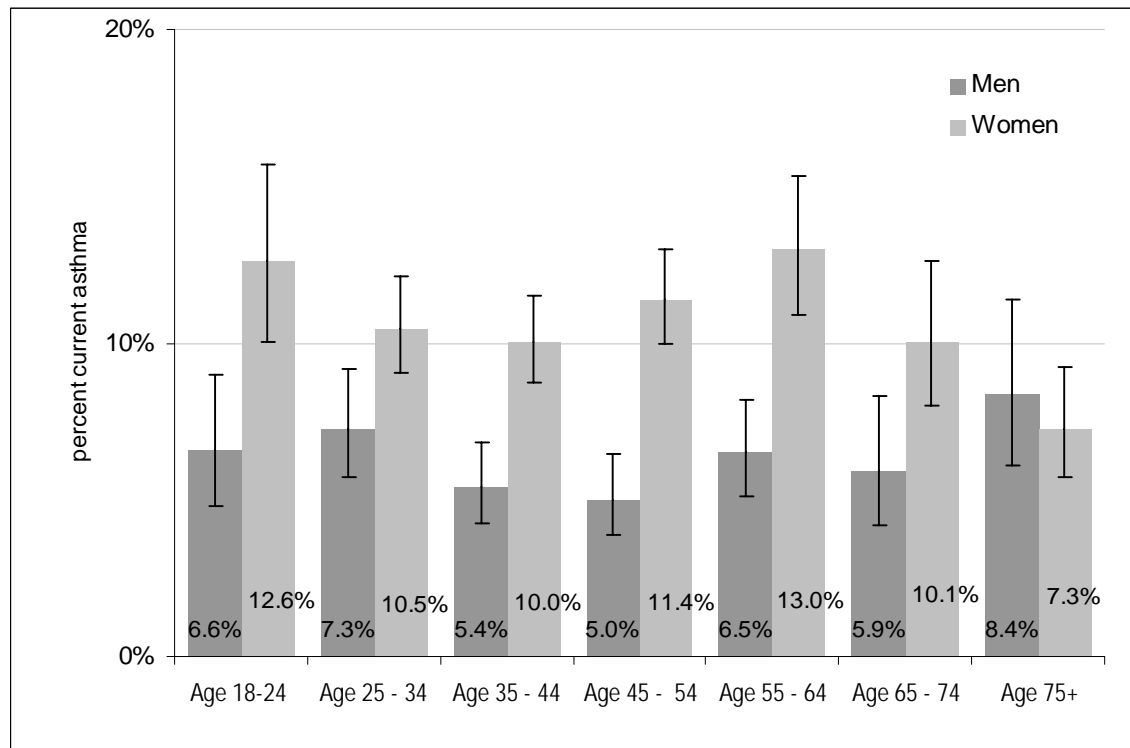
Adult Lifetime and Current Prevalence

Although asthma often begins in childhood, most adults with asthma were first diagnosed with asthma by a healthcare provider after age 18 (see Figure 19). Adult-onset asthma is more common in women, as evidenced by the reversal in the male-female prevalence ratios after puberty.

The prevalence of current asthma among Washington women (10.8%) was significantly higher than for men (6.2%) among all adult age groups combined and among all age groups younger than 75 (see Figure 28). Asthma prevalence increased with age among

women ($p=.01$), but was not significantly associated with age among men. Nationally, the 2000 median prevalence for women was 9.4% and 5.5% for men.^x These adult gender differences in asthma prevalence have also been described in multiple national studies over the past 20 years.^{xi xii}

Figure 3: Prevalence of current asthma by age and gender, among Washington adults



Source: 2001-2003 combined Washington State Behavioral Risk Factor Surveillance System (BRFSS)

A number of possible mechanisms have been suggested, including sex hormones,^{xiii xiv} differences in airway size and responsiveness, or obesity.^{xv xvi xvii xviii xix xx} Some investigators have proposed that women may have an increased likelihood of indoor environmental exposures,^{xxi} or a greater likelihood of allergic disease,^{xxii} which could contribute to higher rates of adult-onset asthma. Occupational exposures play a significant role (as much as 25%) in adult-onset asthma.^{Error! Bookmark not defined., Error!}
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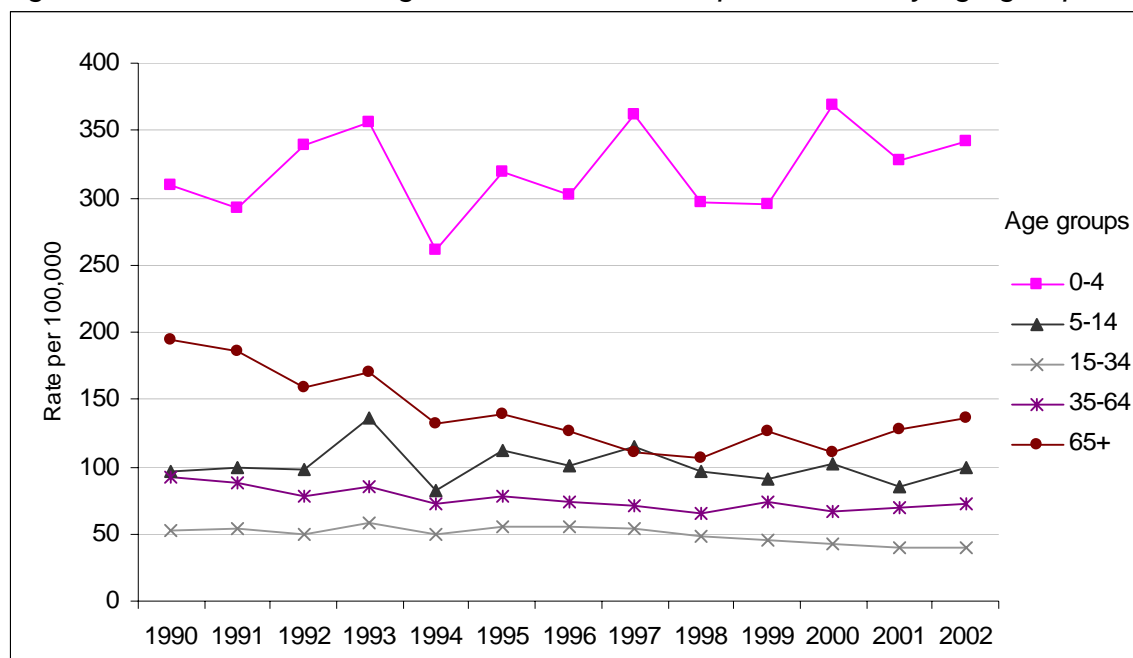
The female-male difference was not significant among Washington's oldest age groups (75 and older), where women had the lowest measured prevalence and males the highest measured prevalence of any adult age groups. It has been suggested that diagnosing asthma is difficult among older adults, where symptoms can be confused with other chronic respiratory illnesses and therefore some late-age diagnoses could be inaccurate (although others may remain undiagnosed for the same reason).^{xxiii}

Hospitalization/Urgent Care

In contrast to prevalence rates, which are lowest for young children, children under five have the highest hospitalization rates – nearly ten times the 15-34 year old age group (341.7 vs. 39.9 per 100,000). People age 65 and older also have comparatively higher hospitalization rates (136.4 per 100,000) in comparison to middle-aged groups although the prevalence is not greater. National hospitalization data indicate a similar pattern for hospitalization by age groups, with the highest rates occurring in infants and the elderly.**Error! Bookmark not defined.**

Washington's overall hospitalization rate for asthma during the past 8 years has been very stable (see Figure 2). The stable trend in hospitalizations is, however, not uniform by age (see Figure 29). Slightly declining trends are observed among people aged five to 64 ($p=.001$ for ages 5-14; $p<.001$ for ages 15-34; $p<.001$ for ages 35-64; and $p<.001$ for ages 65+). In contrast, hospitalization rates have increased overall for young children (ages 0 to 4, $p=.003$) although with considerable year-to-year variation. Despite the substantial decline from 1990 to 1998 in rates for the elderly (65+), there were increases from 1998 to 2002.

Figure 4: Trends for Washington State asthma hospitalizations by age group



Source: Washington State Comprehensive Hospital Abstract Reporting System (CHARS). Asthma as principal diagnoses.

Several factors may explain why hospitalization rates are significantly different for younger and older people. First, “wheezing” is very common in young children, with prevalence rates of between 20-30% reported for children between 12 months and 5 years of age.^{xxiv} Given the variety of potential causes for acute wheezing illnesses among small children, including viral induced wheezing, many children are likely hospitalized for treatment without a clearly evident understanding of what is causing their symptoms. Some of these hospitalizations may be coded as asthma for billing purposes, overestimating the true incidence of asthma hospitalization.

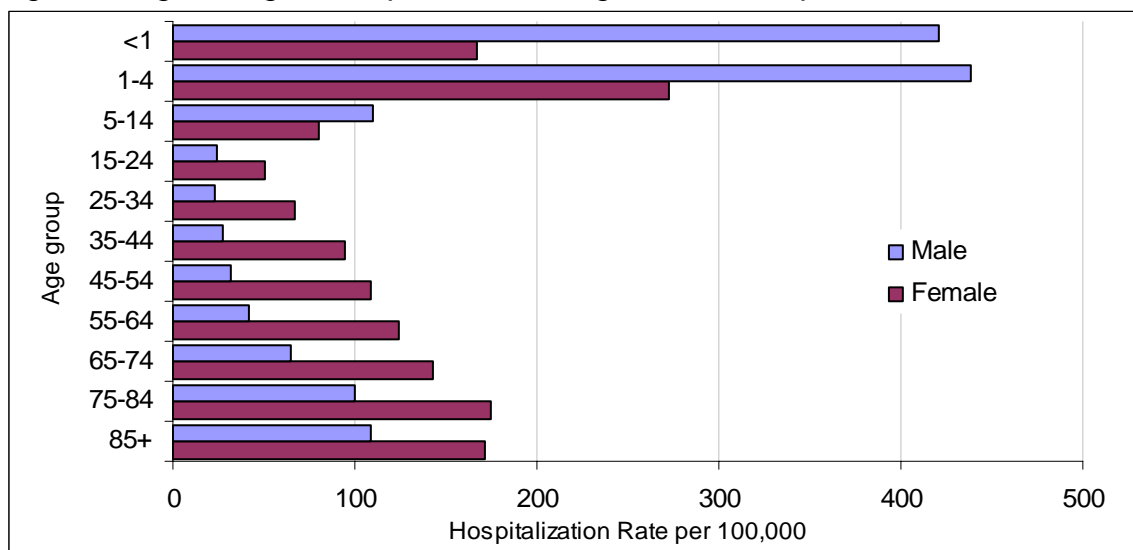
Second, the “threshold for admission,” or the seriousness of symptoms being experienced by an individual before they are admitted to the hospital for treatment, may be increasingly different for different age groups. The admission threshold for asthma has reportedly increased for older children and adults as medical systems increasingly avoid hospitalizations, but the threshold to hospitalize an acutely ill infant or toddler likely remains much lower. Social factors, such as family stress, could influence the decision to admit a young child, as well as the need for close, around-the-clock monitoring for respiratory difficulties. In addition to subjective forces influencing the decision to admit a young child, widespread use of new technology (pulse oximetry) in the evaluation of children having acute breathing difficulty has dramatically increased the sensitivity of detecting low blood oxygen concentrations (mild hypoxemia) and may contribute to increased likelihood of hospitalization.

Young children also have narrow airways which are more prone to obstruction in the course of a viral illness. At about age two, airway size increases and the incidence of viral bronchiolitis begins to wane, and the admission rate for both sexes decreases.

The three most recent years of Washington hospitalization data (2000 to 2002) were combined to examine differences by age and gender more carefully.

Asthma hospitalization rates were higher among boys than girls under age 15 (see Figure 30). The reverse is seen starting at age 15, where it is more common for women to be hospitalized than men. This striking pattern is parallel to patterns observed in prevalence data (discussed previously) and has also observed nationally.^{Error! Bookmark not defined.}

Figure 5: Age and gender-specific Washington State hospitalization rates



Source: Washington State Comprehensive Hospital Abstract Reporting System (CHARS), 2000-2002 combined. Asthma as principal diagnosis.

Aside from background prevalence differences, reasons for higher rates of hospitalization among women in comparison to men have been widely investigated, but are as yet unexplained. There is some evidence that adult women with asthma are more likely to be seen as outpatients, to require an ED visit, or to be hospitalized than men, even after accounting for their greater prevalence.^{xxv xxvi} Although one explanation is that women may have inherently more severe disease, it may also be the case that women have increased perception of symptoms and seek medical attention more often. Alternatively, women may receive less aggressive treatment than men, either because of their own behaviors, or provider practices.

National Objectives

Washington has not yet met Healthy People 2010 objectives for hospitalization among the young and the elderly. Washington hospitalization rates for 2002 were 336 per 100,000 for children under five, 68 per 100,000 for people age 5-64 (age-adjusted) and 138 per 100,000 for people 65 and older (age-adjusted).

Healthy People 2010 Objective 24-2*

Reduce asthma hospitalizations.

Targets:

- 250 per 100,000 for children younger than 5
- 77 per 100,000 for adolescents and adults ages 5-64
- 110 per 100,000 for adults age 65 and older

age-adjusted to year 2000 standard population for 5-64 and 65+ age groups

Data to describe rates of emergency department use in Washington are not available to measure relevant Healthy People 2010 goals; however, about one in ten adults and one in four middle-high school aged youth with asthma in Washington reported having visited an emergency department or urgent care facility in the previous year for asthma symptoms (see discussion Chapter II).

Healthy People 2010 Objective 24-3*

Reduce hospital emergency department visits for asthma.

Targets:

- 800 per 100,000 for children younger than 5
- 500 per 100,000 for adolescents and adults ages 5-64
- 150 per 100,000 for adults age 65 and older

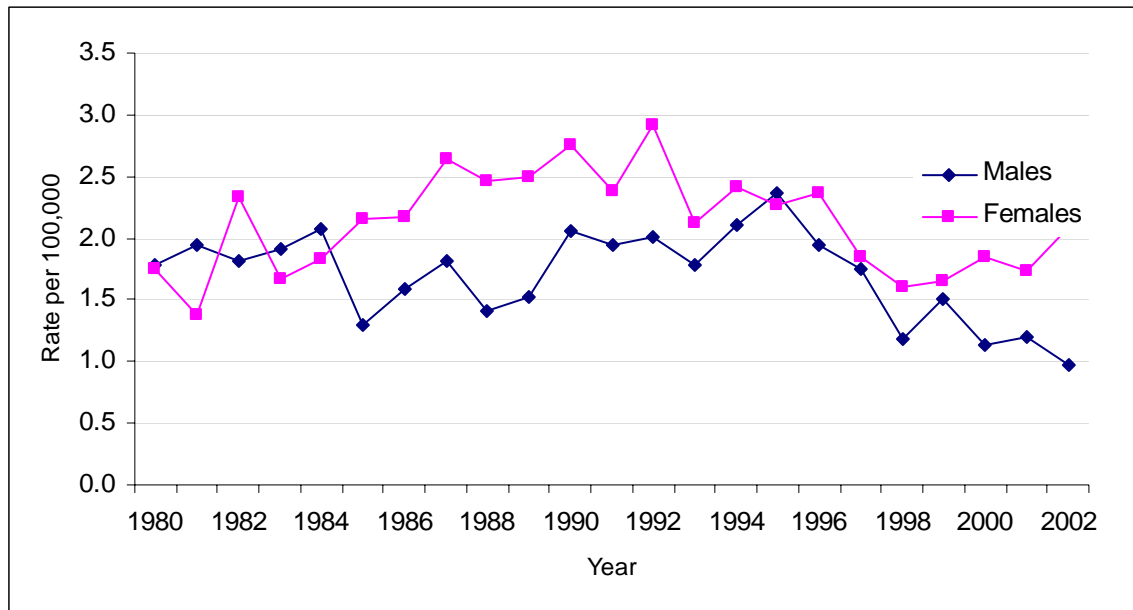
age-adjusted to year 2000 standard population for 5-64 and 65+ age groups

* HP2010 goals presented "per 10,000" in national documents

Deaths

In Washington State between 1980 and 2002, the mortality rate for asthma has tended to be mostly higher for women than men (see Figure 31). This is consistent with gender-specific asthma mortality data from the United States as a whole. **Error! Bookmark not defined.** Although death rates for men and women have declined since the early 1990s, the decline among women seems to have leveled off in the past several years.

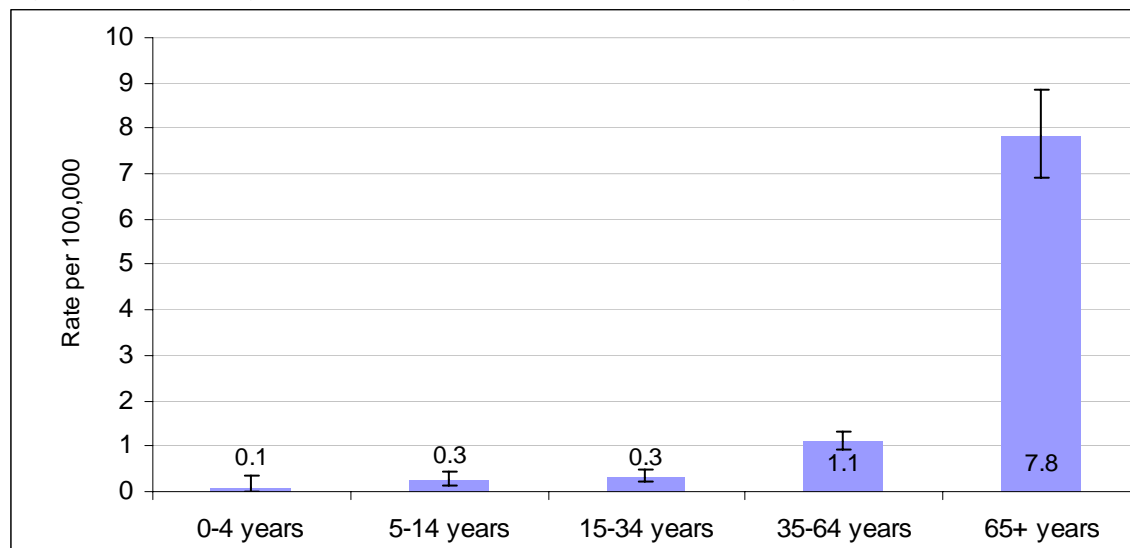
Figure 6: Trends for Washington asthma deaths by gender



Source: 1980-2002 National Death Certificates, Washington State Death Certificates
Asthma as primary cause of death, age-adjusted to 2000 US Population.

Data from 1998-2002 death certificates were combined to create age-specific death rates (see Figure 32). Among children younger than five, there were fewer than five deaths during this period; among children ages five to fourteen there were 11 deaths; among people ages 15-34 there were 28 deaths; among people ages 35-64 there were 127 deaths; and among those 65 and older there were 260 deaths.

Figure 7: Washington State asthma death rates by age group



Source: 1998-2002 combined National Death Certificates, Washington State Death Certificates
Asthma as primary cause of death.

Despite a significantly higher asthma hospitalization rate in Washington State among children under age 5, the asthma mortality rate in this age group is lower than for any other age group. In contrast, asthma can be more dangerous among older adults because they can develop respiratory failure more quickly.^{xxvii} About 60% of the total deaths from asthma occur among people age 65 and older.

National Objectives

Washington has not yet met Healthy People objectives for asthma deaths except among children younger than five. The small number of deaths each year among people younger than 65 results in unstable annual estimates (or even five-year estimates) that are unlikely to exhibit measurable change within the next ten years.

Healthy People 2010 Objective 24-1*

Reduce asthma deaths.

Targets:

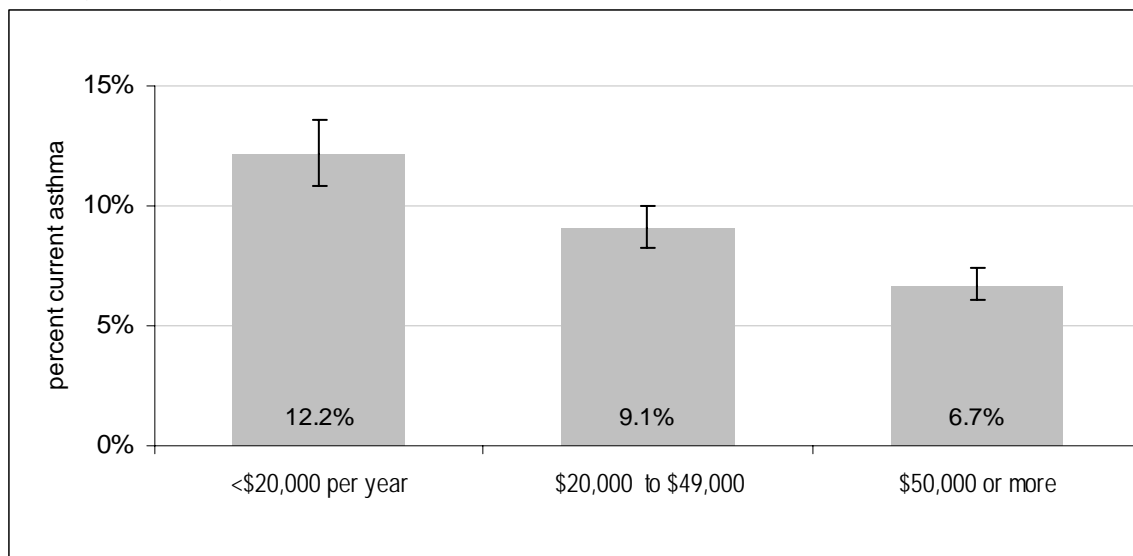
- 0.1 per 100,000 for children younger than 5 and ages 5-14
- 0.2 per 100,000 for adolescents and adults ages 15-34
- 0.9 per 100,000 for adults ages 35-64
- 6 per 100,000 for adults age 65 and older

B. Income and Education

Prevalence

Asthma prevalence was higher in adults with an annual income of less than \$20,000 compared to those with incomes of \$20-49,000 and over \$50,000 per year (see Figure 33, $p < .001$). Adults in the lowest income group had nearly double the prevalence of asthma in comparison to adults in the highest income group. The same pattern has been shown nationally: a large study based on the National Health and Nutrition Examination Survey showed that lower income was the strongest independent predictor of prevalent asthma in both blacks and whites.^{xxviii}

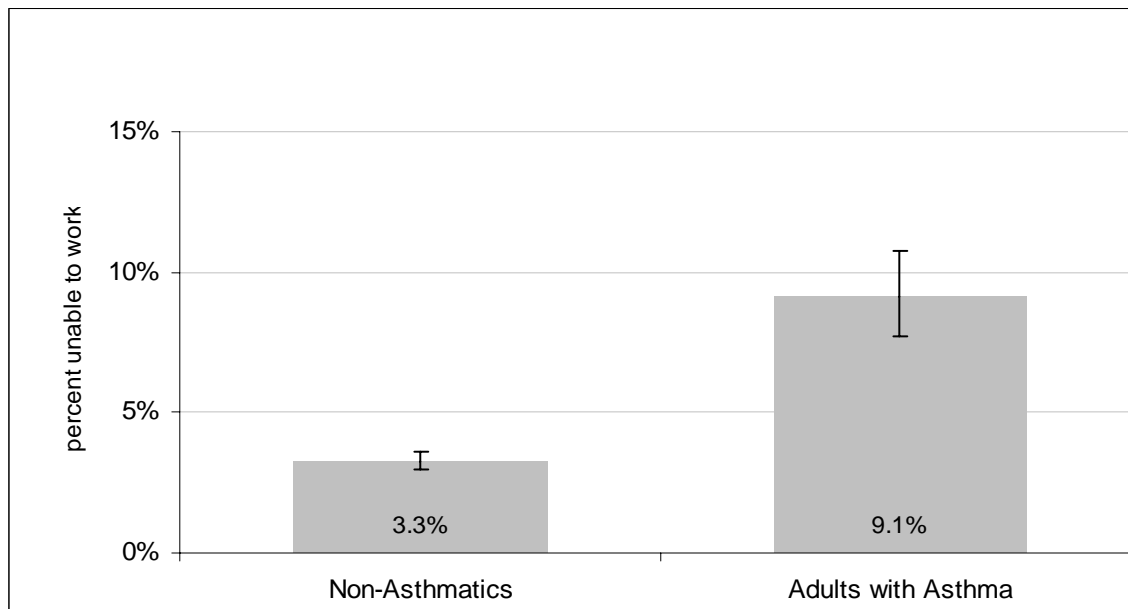
Figure 8: Asthma prevalence by income category, among Washington adults



Source: 2001-2003 combined Washington State Behavioral Risk Factor Surveillance System (BRFSS).

Washington adults with asthma were nearly three times as likely as adults without asthma to report being unable to work (see Figure 34). It is not known what proportions of these people are not working because of work-related asthma, non-work-related asthma, or a work-prohibitive disability unrelated to asthma.

Figure 9: Prevalence of inability to work by asthma status, among Washington adults

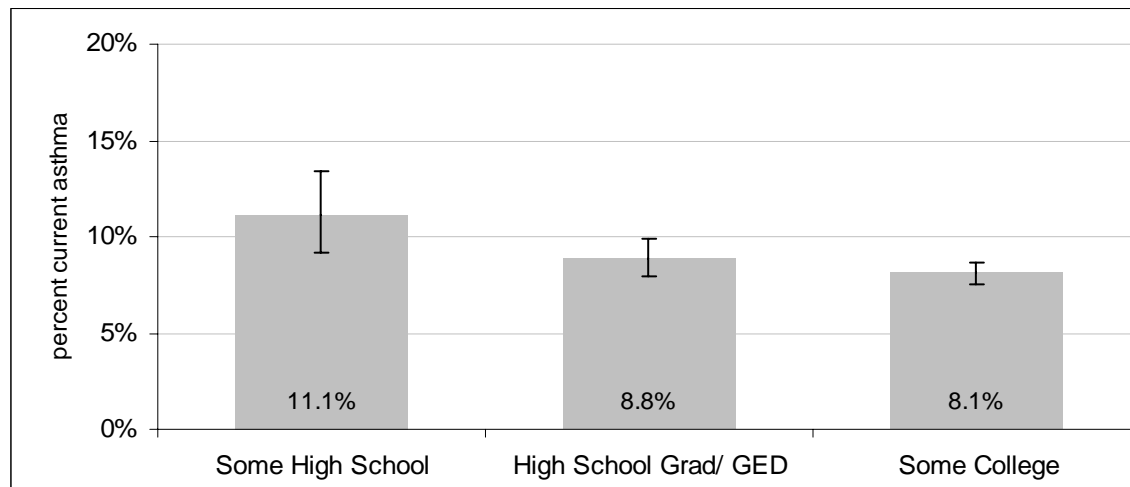


Source: 2001-2003 combined Washington State Behavioral Risk Factor Surveillance System (BRFSS). Ages 65+ are excluded.

Washington data for youth asthma prevalence by family income level were not available. National studies indicate that children in poor families (15%) are more likely to have been diagnosed with asthma than children in families that are not poor (12%). Children in single-mother families (16%) were more likely to have ever been diagnosed with asthma than children from two-parent families (11%).^{xxix}

Education is strongly associated with income status. Therefore it is not surprising that progressively lower prevalence of asthma was observed with increasing educational attainment among adults (see Figure 35, $p < .005$).

Figure 10: Prevalence of asthma by educational attainment, among Washington adults



Source: 2001-2003 combined Washington State Behavioral Risk Factor Surveillance System (BRFSS).

There are several possible reasons for a higher prevalence of asthma for adults in lower socioeconomic groups. These include greater exposure to indoor and outdoor environmental pollutants such as tobacco smoke, particulate exhaust, and/or environmental allergens (dust mites, cockroach particles, and animal dander), and/or greater prevalence of risk factors (smoking, obesity). Some studies have also pointed to lower quality primary care.^{xxx xxxi}

Recalling the associations between self-reported academic achievement and asthma severity among youth (see Figure 16), and considering national studies that have indicated asthma is associated with frequent school absences,^{xxxii xxxiii} it is possible that asthma contributes to decreased educational status. Also, people with asthma were more likely to report being unable to work. Considering these findings, the person with asthma may potentially be at risk for lower income status – in other words, the relationship may go both ways.

Hospitalization/Death

Personal income and education are not identified as part of Washington's Death or Hospitalization data systems.

Discussion

Studies examining the link between socioeconomic status and asthma confirm that the impacts of asthma are greatest on low income populations. **Error! Bookmark not defined. Error! Bookmark not defined.**^{xxxiv} For example, in the U.S. in 1996, pediatric hospitalizations for asthma were estimated to be five times higher for children in lower income families.**Error! Bookmark not defined.** The National Cooperative Inner-City Asthma study demonstrated that over 50% of study participants, poor children living in inner cities, found it difficult to get follow-up asthma care. Among those with severe asthma, less than half were using anti-inflammatory medication.^{xxxv}

C. Race/Ethnicity

Washington's population is more than 80% white non-Hispanic. Historically, it has been difficult to describe any minority populations individually because of small numbers of any one race/ethnic minority group were included in public health surveillance systems. Fortunately, recent administrations of adult and youth surveys have increased sample size sufficiently to create such estimates.

Prevalence

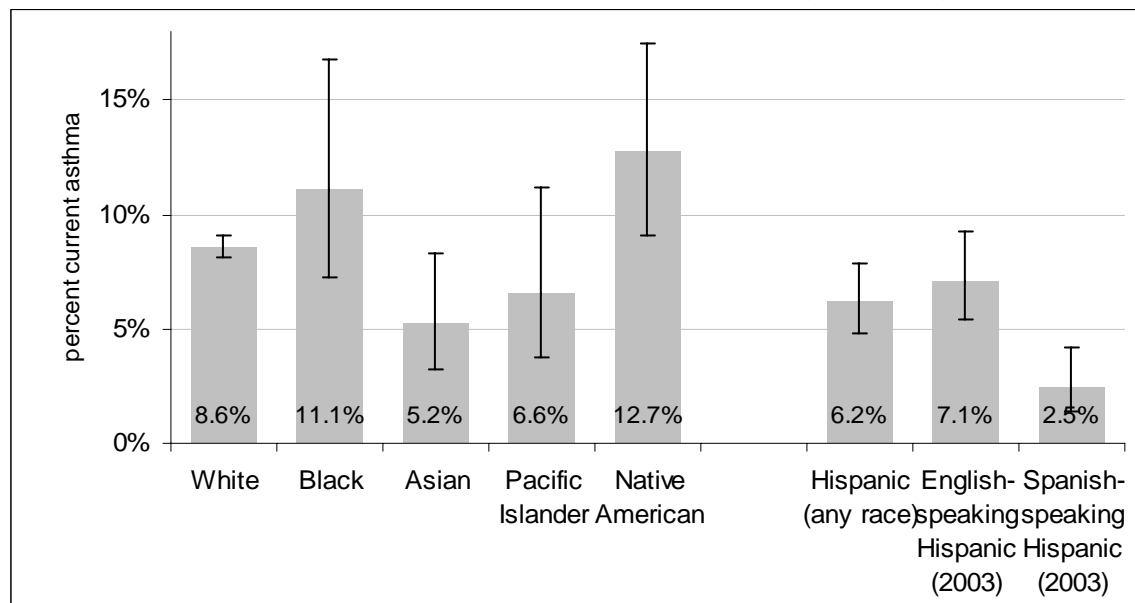
The prevalence of asthma among Washington adults was significantly lower for Asians and Hispanics (any race) than for non-Hispanic whites (see Figure 36). Asthma prevalence was higher among Native Americans than among non-Hispanic whites.² All other race/ethnic groups were similar to whites, although the small numbers prevent meaningful conclusions.

Spanish language was added to the Washington BRFSS in 2003, for the first time allowing inclusion of Spanish-speaking Hispanics in the survey as well as stratification of Hispanics by language spoken as a measure of acculturation or adoption of "mainstream" Washington culture. In 2003, Spanish-speaking Hispanics were significantly less likely than English-speaking Hispanics to report having asthma. English-speaking Hispanics were similar to non-Hispanics in reported prevalence of asthma.

Spanish-speaking Hispanics are likely to be recent (or first generation) immigrants, while English-speaking Hispanics may be second generation or more. Previous studies have documented important health differences among Hispanics by acculturation; for example, less acculturated Hispanic women are much less likely to smoke than more acculturated Hispanic women.^{xxxvi}

² Each group was compared to white/non-Hispanics in a logistic regression model for association of race/ethnicity with asthma: $p=.007$ for Native American, $p=.03$ for Asian; $p=.009$ for Hispanic vs. non-Hispanic (any race) and $p<.001$ for Spanish-speaking vs. English-speaking Hispanics.

Figure 11: Prevalence of asthma by race/ethnicity, among Washington adults

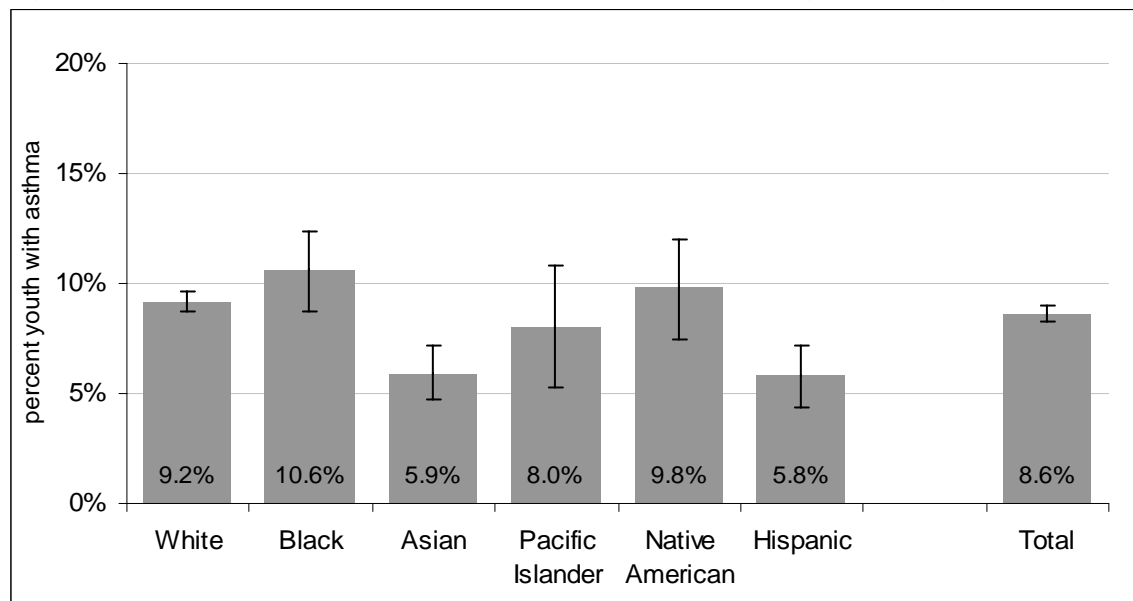


Source: 2001-2003 combined Washington State Behavioral Risk Factor Surveillance System (BRFSS). Hispanic ethnicity collected separately from race.

Among youth, Asians and Hispanics were again less likely than White non-Hispanics to have asthma, but significant differences between non-Hispanic whites and other groups were not found (see Figure 37).³ This survey does not allow for distinction of English from Spanish-speaking Hispanics.

³ Odds for current asthma were .6 ($p < .001$) for both Asian and Hispanic youth in comparison to white non-Hispanic youth, after adjustment for grade.

Figure 12: Prevalence of asthma by race/ethnicity, among Washington youth



Source: combined 2002 and 2004 Washington State Healthy Youth Survey (HYS), 6-8-10-12th grade-standardized. Race and Hispanic ethnicity collected as part of a single question.

Hospitalization/Death

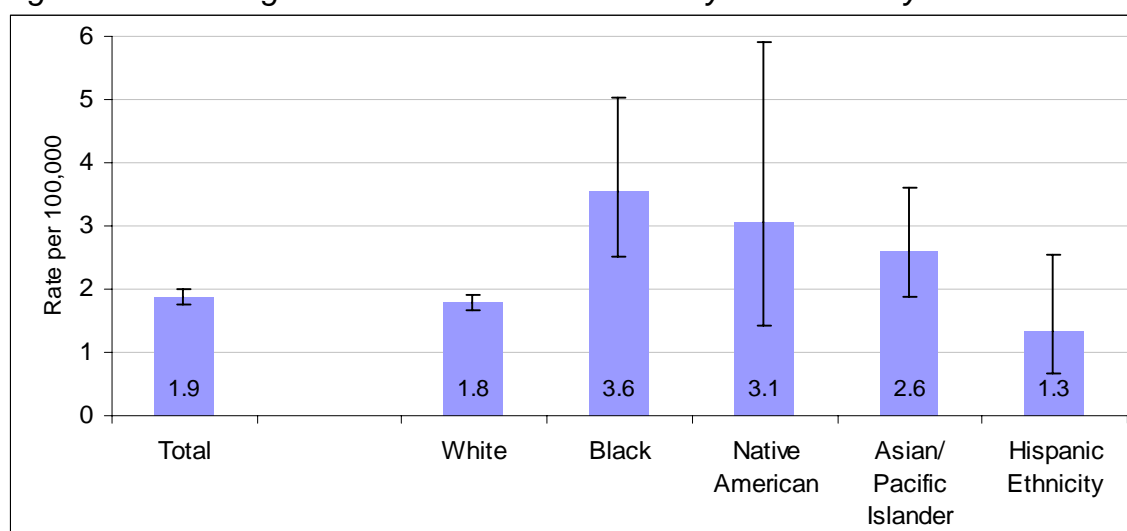
Washington's hospitalization data collection system does not include information about race or ethnicity of the patient; therefore we do not know whether that burden is different for different groups. National data for adults indicate that women of within all races have higher rates of illness and death from asthma than men,**Error! Bookmark not defined.** so we would expect that within any minority group women in Washington would also have higher hospitalization rates than minority men.

To create meaningful estimates of asthma death rates in Washington among race and ethnic groups, ten years of Death Certificate data were combined. Age-adjusted death rates for Blacks, Native Americans,⁴ and Asian/Pacific Islanders were all higher than for whites (see Figure 38). Hispanics were similar to whites. These differences in death rates are disturbing because only for adult Native Americans were asthma prevalence estimates greater than for non-Hispanic whites. This may indicate that minority group members with asthma have less access to care or quality care for their asthma.

It is important to recognize that the actual numbers of deaths are small, therefore even a few deaths prevented among small subgroups could substantially change the death rate. During 1992-2001 there were 49 asthma deaths among Blacks, 13 among Native Americans, 50 among Asian and Pacific Islanders, 14 among Hispanics, and 851 among whites – a total of 963 deaths.

⁴ Although Native American difference was non-significant at $p=.06$, rates are expected to be underestimated based on under-reporting of Native American race in Death Certificate data (see discussion on Death Certificate data in Appendix A)

Figure 13: Washington death rates from asthma by race/ethnicity



Source: 1992-2001 combined Washington State Death Certificates Asthma as primary cause of death, age-adjusted to 2000 US Population. No comparability ratios were used to account for 1998 change from ICD-9 to ICD-10 codes.

Discussion for Individual Race/Ethnic Groups

Although asthma affects Americans of all ages, races, and ethnic groups, low-income and minority populations experience substantially higher rates of fatalities, hospital admissions, and emergency department visits due to asthma. Several reports ^{xxxvii} have indicated that observed racial/ethnic disparities are attenuated but do not disappear upon adjustment for socioeconomic factors.

In the United States, the prevalence of asthma for nonwhites is only slightly higher than for whites, yet the death, hospitalization, and Emergency Department visit rates for nonwhites are more than twice those for whites. Although reasons for these differences are unclear, they likely result from multiple factors: high levels of exposure to environmental tobacco smoke, pollutants, and environmental allergens/triggers (for example, house dust mites, cockroach particles, cat and dog dander, and possibly rodent dander and mold); a lack of access to quality medical care; and a lack of financial resources and social support to manage the disease effectively on a long-term basis. ^{xxxviii} Research into the role of socioeconomic factors is needed to identify additional prevention opportunities.

Black/African American

In 2002, National Health Interview Survey data documented that the current asthma prevalence among African Americans was 38% higher than in whites (9.6% vs. 6.9%). **Error! Bookmark not defined.** National hospitalization rates for asthma, reported on the National Hospital Discharge Survey, are over three times higher for blacks than for whites, (36 per 10,000 vs. 11 per 10,000). **Error! Bookmark not defined.** African Americans are approximately five times more likely than whites to seek care for asthma at an emergency department. ^{xxxix}

The prevalence of current asthma among African Americans in Washington was not significantly different than among non-Hispanic whites, but death rates were significantly

greater. This is similar to national findings and suggests an important health disparity within the population for control of asthma.

Asian/Pacific Islander

There are few studies on asthma among Asian/Pacific Islanders. The “Asian” or “Pacific Islander” categories actually represent a grouping of many culturally diverse sub-groups (e.g., Korean, Japanese, Native Hawaiian, Laotian peoples). More information to describe patterns of exposure, treatment and knowledge within these subgroups is necessary to understand the burden of asthma within communities.

For both adults and youth in Washington the prevalence of asthma among Asians was lower than for non-Hispanic whites, and Pacific Islanders were similar. The death rate for Asian and Pacific Islanders combined was greater than for whites. This suggests an important health disparity within the population for control of asthma.

Native American/American Indian/Alaskan Native

National surveillance data to describe asthma among Native Americans are limited. One paper examined asthma prevalence among American Indian and Alaska Native (AI/AN) children using 1987 National Medical Expenditure Survey data, and reported a prevalence of 7.1% among AI/AN children 0-17, compared with a national estimate of 8.4% for all children 0-17 (these estimates were not significantly different).^{xi} However, no stratification could be done for income or rural/urban residence, two factors where AI/AN children differ substantially from whites, and which are highly related to asthma prevalence and severity. In a second report on AI students (6th grade through 9th grades) 7.4% of students said they had ever received a diagnosis of asthma from a doctor.^{xli} A report on hospitalization trends, relying only on data from the Indian Health Service (IHS), showed increases similar to those for white children (about 2.6% per year from 1979 to 1989.)^{xlii} Another report, based on Washington State data, showed similar hospitalization rates for AI/AN children compared to children of all races, except for infants, whose rates were over twice as high, with sharply increasing trends from 1987 to 1991.^{xliii}

Adult Native Americans had a higher prevalence of asthma than non-Hispanic whites, and also higher rates of death. This suggests that there are important disparities in factors related to the development of asthma and control of asthma.

Hispanic/Latino

Hispanics are the fastest-growing minority group in Washington State. The 2000 Census indicated that 7.5% of Washington’s population is Hispanic/Latino, with that population size projected at greater than 500,000 by 2003, and 11 of Washington’s 39 counties have more than 20 percent Hispanic population.^{xliv}

Hispanics who take health surveys in Spanish may be considered “less acculturated” to the mainstream population and exhibit different risk or health behaviors, including some healthier behaviors such as lower rates of cigarette smoking.^{xlv, xxxvi} However, people who do not speak English and who are employed in agriculture may also have increased

exposure to irritating chemicals, and if part of the migrant farmworker population they would not be captured in random-digit-dial telephone surveys. Therefore, the low rate of asthma reported for this group is potentially an underestimate. Also, less acculturated Hispanics are more likely to live in poverty and have less access to healthcare support for preventive care or clinical control of asthma or other conditions.^{xlvi}

Current asthma prevalence among Washington Hispanic youth and adults overall was significantly lower than non-Hispanic whites, but for adults we were able to stratify by language (as a measure of acculturation) and there was no difference in asthma prevalence between English-speaking Hispanics and non-Hispanics. It has been reported that there is substantial variation in asthma prevalence between Hispanic sub-groups, with Puerto Ricans reporting the highest prevalence.^{xlvii} Washington's Hispanic population originates predominantly from Mexico.

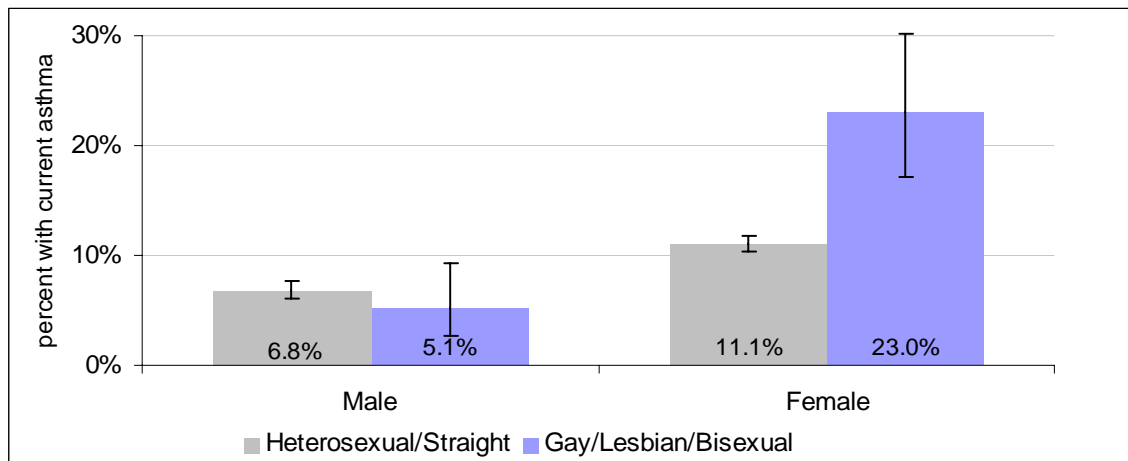
Considering the rapid growth of Hispanic/Latinos, similar health burden of asthma among more acculturated subgroups, and lack of access to care, these groups deserve attention. For less acculturated (Spanish-speaking) Hispanics, where data indicate a lower prevalence of asthma than among non-Hispanics opportunities may exist to assure prevention of work-related asthma and access to care. Without such focused attention, efforts to improve asthma risks and outcomes that are directed to the "mainstream" population may fail to reach Hispanic/Latino groups such that new disparities are created.

D. Sexual Orientation

Prevalence

Beginning in 2003, the BRFSS telephone survey included a question about sexual orientation. Gay and bisexual men, as well as lesbian and bisexual women were combined for comparison to their heterosexual (straight) counterparts. Lesbian/bisexual women were twice as likely to report having asthma than straight women, but there was no significant difference between gay/bisexual men and straight men (see Figure 39).

Figure 14: Asthma prevalence by sexual orientation within gender, among Washington adults



Source: 2003 Washington State Behavioral Risk Factor Surveillance System (BRFSS).

Hospitalization/Death

Sexual orientation is not identified in either hospitalization or death data. There are also no national data sources about morbidity and mortality from asthma in these groups.

Discussion

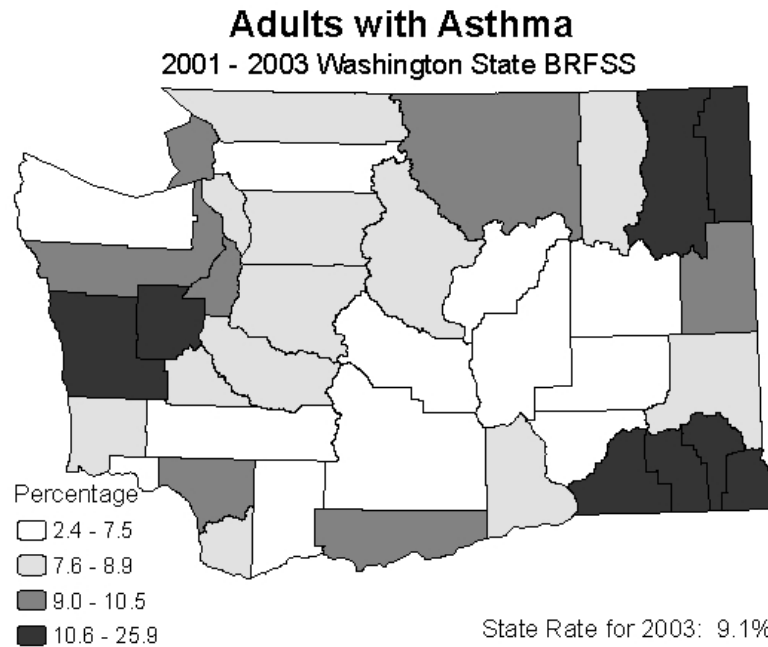
Sexual minority groups are gaining attention as an important group to consider for chronic disease prevention. For example, the prevalence of cigarette smoking among gay/bisexual men and lesbian/bisexual women is approximately double that of their heterosexual counterparts.^{xlvi} Higher prevalence rates for current asthma among lesbian/bisexual women suggest a need for focused efforts to reach this population group.

E. Geographic Area

Prevalence

Although there were not statistically significant differences among counties for asthma prevalence, prevalence estimates varied (see Figures 40, county-level prevalence estimates with population size estimates are included in Appendix D). County-level estimates for prevalence of current asthma among adults ranged from 2% to 26%.

Figure 15: Asthma prevalence by county, among Washington adults

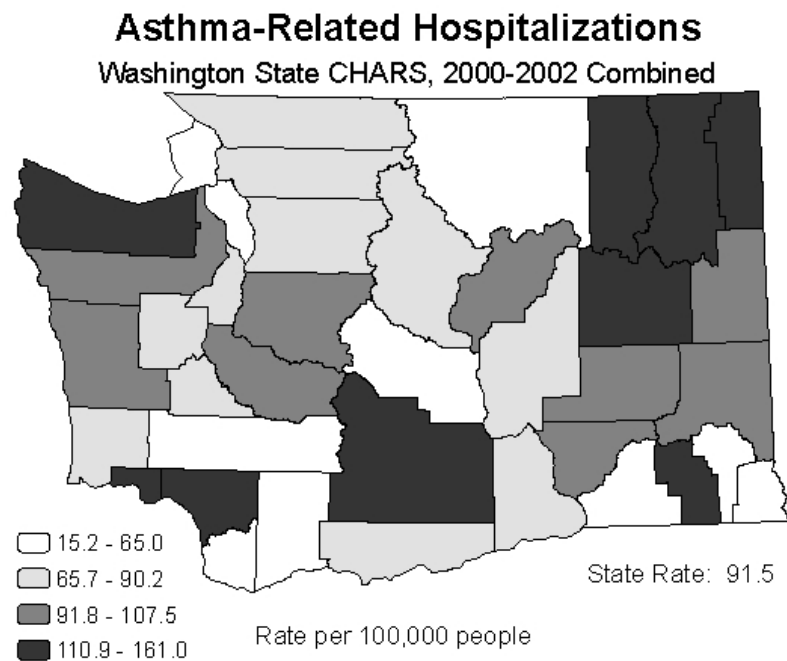


Source: 2001-2003 combined Washington State Behavioral Risk Factor Surveillance System (counties); state rate for 2003 only.

Hospitalization/Death

Hospitalization rates differed among Washington counties with no obvious geographic pattern (see Figure 41). Rates ranged from 15 to 161 per 100,000.

Figure 16: Hospitalization rates by county for Washington State



Source: 2000-02 combined Washington State hospitalization records (CHARS)

Discussion

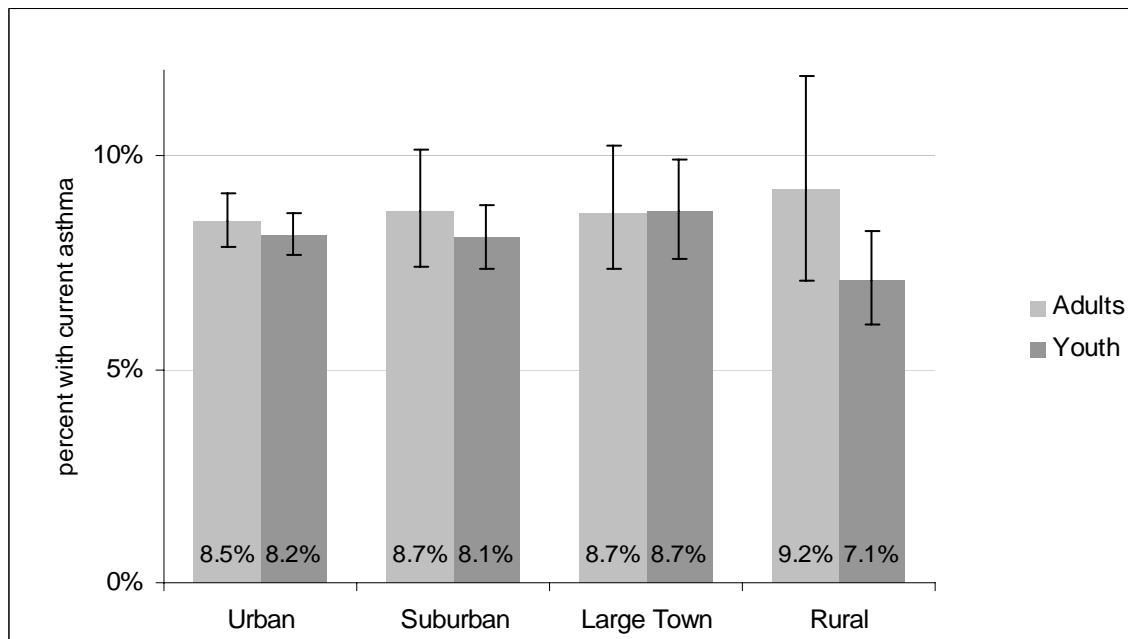
Stevens, Pend Oreille, and Columbia Counties all were among the highest group for both hospitalization and adult prevalence of asthma, but there were no other obvious geographic patterns or in county-level prevalence or hospitalization rates. Lack of patterns in burden may be partly due to variability in estimates and partly due to unique characteristics of Washington counties that influence asthma prevalence and hospitalization. For example, differences in county-level hospitalization rates may be related to different availability of routine healthcare services for preventive or mild acute care in different regions of the state, including geographic/transportation or economic barriers to care. A lack of pattern suggests that asthma program planning may benefit from a county-by-county analysis of risk factors, support systems and populations.

F. Urban and Rural Communities

Prevalence

For both adults and youth, there were no consistent differences in asthma prevalence by urban or rural community types (see Figure 42), although the prevalence of asthma among youth in rural areas was less than for urban areas.

Figure 17: Prevalence of asthma by community type, among Washington adults and youth

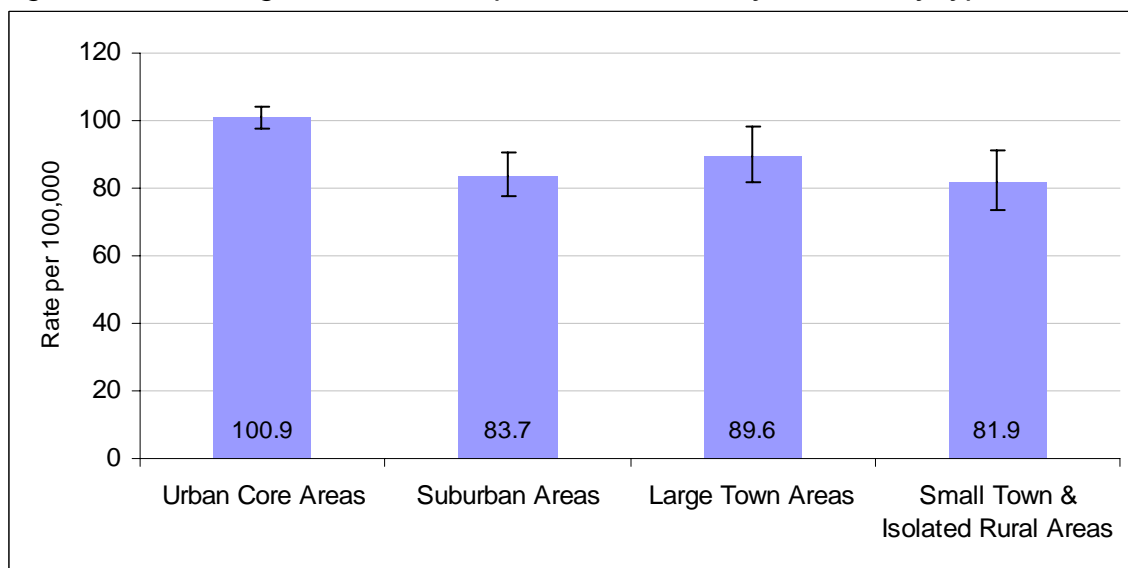


Source: 2001-2003 combined Washington State Behavioral Risk Factor Surveillance System (BRFSS); 2002 and 2004 combined Washington State Healthy Youth Survey (HYS)

Hospitalization/Death

Urban communities have the highest rates of hospitalization, and are significantly greater in comparison to more rural community types.

Figure 18: Washington asthma hospitalization rates by community type



Source: Washington State Comprehensive Hospital Abstract Reporting System (CHARS), 2002. Asthma as principal diagnosis, rate per 100,000. RUCA assigned by patient zipcode. Age-adjusted to year 2000 standard US population.

Discussion

More than half of Washington adults with asthma live in urban communities (55%), while 18% live in suburban, 11% live in large towns, and 19% live in rural areas. Prevalence is not substantially different by community type, but excess hospitalization rates in urban settings indicate that attention in these areas for asthma programs may be warranted.

Researchers have examined urban residence as a risk factor for asthma, and found that after controlling for various factors such as race or income, all urban children were at increased risk for asthma.^{xlix} Other studies^{Error! Bookmark not defined.} v xxviii xxxi xxxvii xlix 1 li have pointed out that urban characteristics such as increased exposures to air pollution (from inner-city residence), overcrowding, and greater exposure to irritants such as cockroach allergens, are the among factors that partially account for observed racial disparities in asthma prevalence, morbidity and mortality.

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